Task shifting

Task Shifting: A high-level analysis of scholarship

Background – With changing patterns of disease and significant demographic shifts governments and the nursing profession is having to examine how services can be delivered to pursue and deliver universal health coverage. Consequently, there has been considerable discussions on task shifting, sharing and delegation.

Methods - This study examines the corpus of indexed literature on the subject of task shifting through a mixed-method bibliographic analysis of the scholarship contributions of both the medical and nursing professions. Bibliometrics is used to identify underlying thematic structures of the research underpinning the topic, providing information on the most prolific authors, illuminating connections between peers, and mapping the general themes that have been investigated, and how they change over time.

Interpretation – A total of 1,833 unique papers contributed to the corpus of literature with increased rates of scholarship on the topic being associated with the publication of the declaration of Alma Ata and the World Health report of 2006. Scholarship on the topic is widely dispersed globally and illustrates that groups of authors regularly collaborate on the application of task shifting to populations/groups both disease and condition oriented, various human resources for health and care intervention reform, underpinning regulatory changes and, the pursuit of universal health coverage. Up until this point, the work on task shifting has given only limited consideration to the use of technology as a means of generating more comprehensive solution sets. The need to include technology solutions as part and parcel of future research studies should be pursued.

Key Words: Task Shifting; Task Sharing; Delegation; Bibliometrics; Nursing 2020; Nursing Now

Task Shifting: A high-level analysis of scholarship

Task shifting is not a new concept and significant research on the topic has been undertaken over the years, including several systematic, and meta-analytical reviews (World Health Organization, 2008; European Commission, 2019). In addition, more specific reviews of the impact of task shifting relevant to the provision of primary care services by nurse practitioners has also been published (Maier et al. 2017). These studies have examined the application of the concept in different settings, different geographies, and with different client groups. However, to this point no high-level or wide-angled analysis of the corpus of literature indexed on this subject has been produced. Through such an analysis, a more complete understanding of the general domains of enquiry, the relationships between these domains and, through reflection on the findings of this analysis, opportunities for further research and policy advocacy can be identified.

Today, governments around the world are addressing the challenge of delivering universal health coverage as they pursue the targets set by the United Nations' Sustainable Development Goals (United Nations General Assembly, 2015; World Health Organization, 2019a). Additionally, the global *Nursing Now* campaign and the World Health Organization's (WHO, 2019b) declaration of 2020 as the International Year of the Nurse and Midwife, make this study particularly relevant as we optimize nursing's role in the pursuit of universal health coverage. Accordingly, we contend this is an opportune time to compare and contrast scholarship on the topic.

METHOD

This study examines the corpus of indexed literature on the subject of task shifting through a mixed-method bibliographic analysis of the scholarship contributions of both the medical and nursing professions and focus on potential regulatory implications.

Bibliometrics is a form of big data analytics that, although not widely used by nurse researchers, has been increasingly used as access to indexed literature has improved, desktop software developed, and low-cost high-computational-power computing has become more readily available (Smith and Hazelton, 2011). Unlike systematic and meta-analytical reviews that focus on a narrowly defined area of scholarship, bibliometrics enables researchers to take a wide-angle view of the topic (Benton and Benton, 2019). Bibliometrics can identify the underlying thematic structures of research supporting a topic, provide information on the most prolific authors, illuminate connections with peers, and map general themes that have been investigated as well as how they change over time (Benton and Alexander,2016).

Data Extraction

To undertake a bibliometric analysis requires data from one or more of the readily available databases to be identified, extracted, and then analyzed. Scopus (Elsevier) was used for this study. It is the largest of the databases to provide not only bibliometric data, but also citation information. To identify relevant literature, a structured systematic search using keywords, logical operators, and database delimiters was used. The following search string ((("Task" AND ("Shifting" OR "Sharing")) OR ("Delegation"))) delimited to articles relating to medicine or nursing was used. Furthermore, the titles and abstracts of the identified papers were reviewed to

ensure that only articles relating to the concept of task shifting as it relates to human resources for health and not cognitive science were retrieved and saved as a common separated values (CSV) format file.

Co-author and Co-occurrence Analysis

Data were then uploaded into the bibliometric analysis package VOSviewer (Visualization of Similarities) to conduct co-author and co-occurrence analyses. A co-author analysis can identify whether the authors contributing to the science are interconnected, creating communities of scholarship. The more connected the authors are, the more likely that an evolved and coherent body of knowledge exists. Callon and colleagues (1983) noted that by setting a minimum frequency of three papers, ongoing collaborative teams of scholars can be identified. Also, by looking at the countries where the scholars are based, the extent of global, regional, or local collaboration can be assessed.

Co-occurrence analysis provides a means of identifying the general themes of inquiry that the research is pursuing. VOSviewer, developed at the University of Leiden (Netherlands), uses multivariate analysis to identify clusters of words that are related to one another (Van Eck and Waltman, 2014). The closer words are placed on the resulting visualization, the more related they are to one another. The thicker the connecting lines between words, the stronger the relationship between the words. Often these networks of terms and clusters overlap and can be difficult to interpret visually. To clarify themes, the researchers independently reviewed the key words allocated to each cluster and then offered a short synopsis title, distilling the essence of the

group of words, and provided an associated succinct description. Differences between the researchers' interpretations were then discussed until an agreed analysis was generated.

Ethical Approval

As this study is a secondary analysis of available data and no human subjects were involved, ethical committee approval was not required.

RESULTS

Data were extracted and downloaded on February 1, 2020. A total of 1,646 papers on task shifting relating to medicine and 307 papers relating to nursing were identified. A number of these overlapped and after de-duplication, 1,833 unique papers remained for analysis. As can be seen in Figure 1, indexed papers from medicine started in 1958 and papers from nursing in 1974. However, publications were initially sporadic, and it was not until 1969 for medicine and 1990 for nursing that articles started to appear on a regular basis. In the case of medical output there was a small spike in publications in the late 1970s and through closer examination of the papers, the genesis of this was identified as the impact of the publication of the Alma Ata declaration (WHO, 1978). The Alma Ata declaration agreed by WHO member states including the United States advocated for the advancement of primary care-based services. More rapid growth in publications in both medicine and nursing ensued after the publication of the World Health Report published during the mid-2000's (WHO, 2006). This is perhaps unsurprising as the report provided a comprehensive analysis of workforce supply and how this impacted on the pursuit of the then millennium development goals. Figure 1 has trend lines superimposed for both the

medical and nursing data. So, in summary, medicine not only started focusing on this topic earlier than nursing, but also continues to contribute to scholarship at a much higher rate. Irrespective of the differentiated contribution rate the remaining analysis of scholarship is conducted as a single corpus of literature as both disciplines are focusing on similar issues.

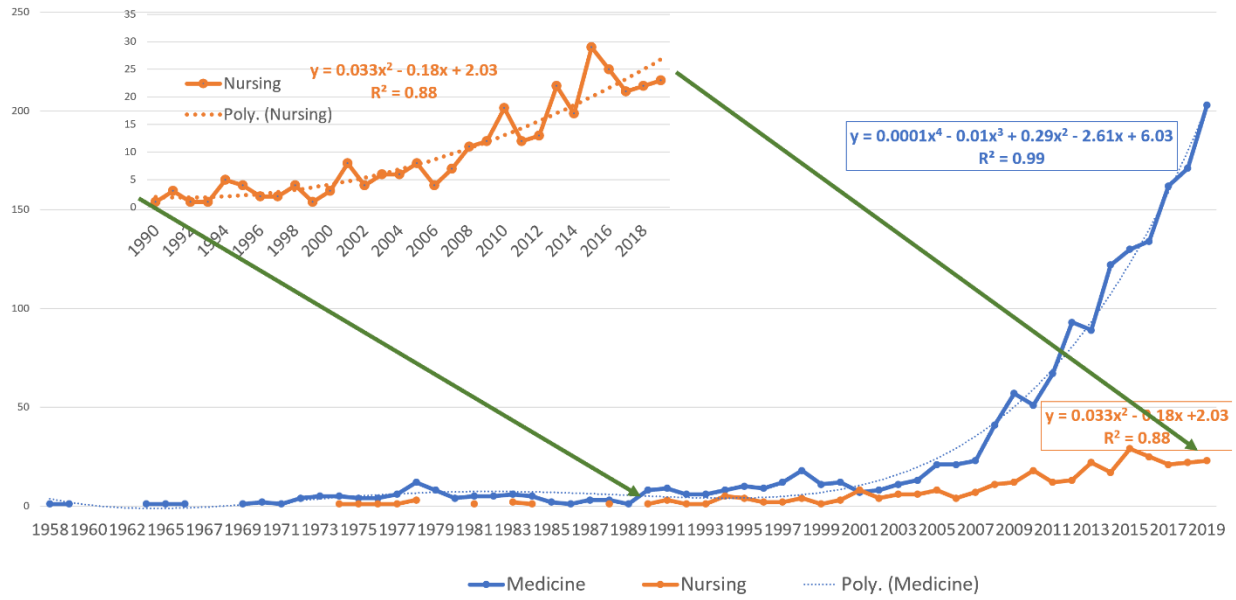

Figure 1: Frequency of Indexed Papers

When examining paper titles and abstracts during data cleaning, in addition to the transfer of tasks from one discipline to another and the redistribution of tasks within the same discipline to different levels of practitioner, two other approaches were noted. First, an increased focus on task sharing where two or more providers could deliver an intervention to the same standard but with differing original educational preparations. All these features have regulatory implications in terms of scope of practice, education and standards of care and conduct. Second, the role of technology in either supporting more efficient delivery of tasks or as a means of delivering services in new and increasingly autonomous ways. Again, this may have scope of practice

implications as well as well as raising questions about how such technology is accredited and or regulated.

Co-authorship analysis identified that of the 7,098 authors contributing to the corpus of work, 326 had produced three or more papers. Of the 326 authors, 126 are linked through co-authorship publishing in 13 clusters of activity. Figure 2 shows that several of the authors have been more prolific than their peers as indicated by the larger-sized nodes of Ford, Patel, and Lund.

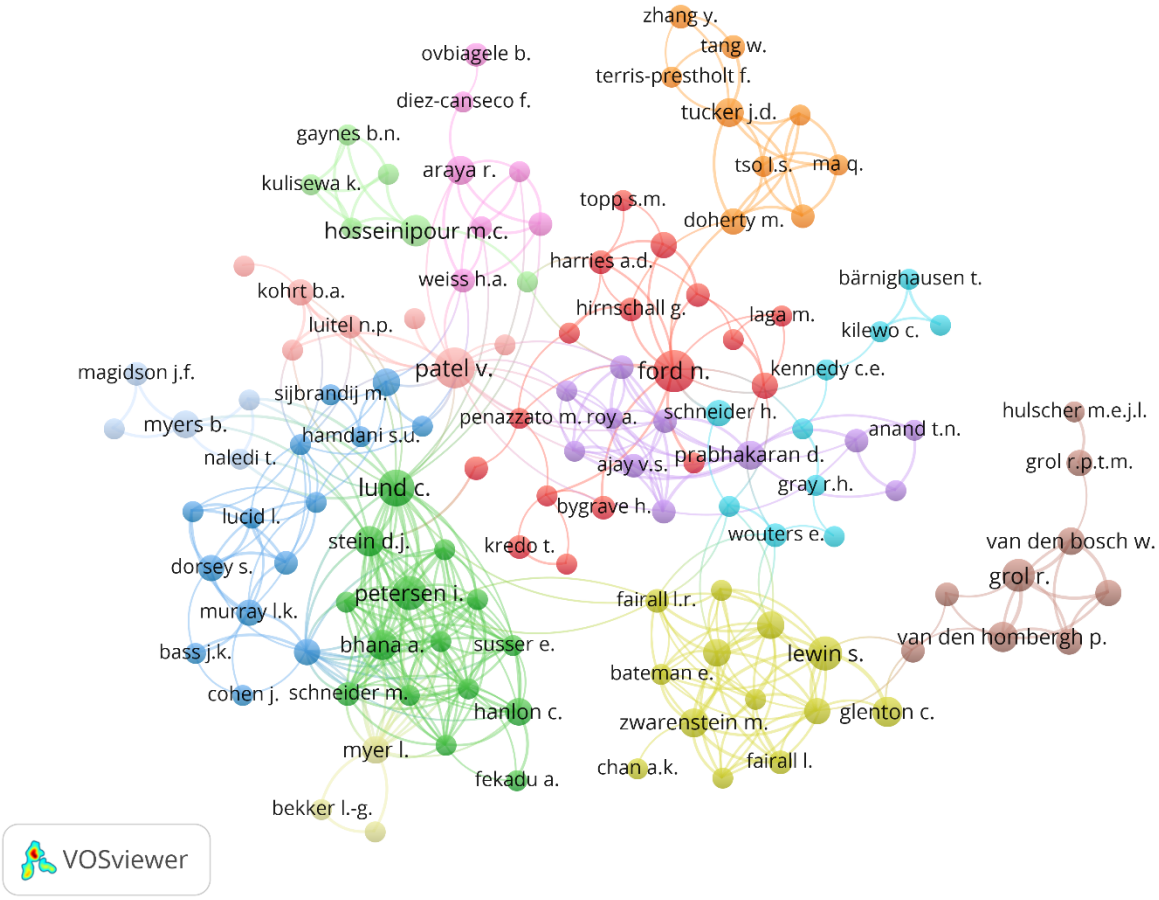

Figure 2: Co-authorship Analysis of Authors with 3 or More Papers

Co-authorship analysis by country illustrates an extensive network of scholarship (Figure 3). The published output on task shifting indexed in Scopus originated from authors located in 106

countries, all but six of which form a connected network. Authors from Egypt, the Russian Federation, Romania, Serbia, Latvia, and Hungary have contributed to this literature but are not connected to each other or to the network illustrated in Figure 3. Authors from the United States and the United Kingdom are prolific contributors There are also large numbers of authors based in the Netherlands, South Africa, Canada, Australia, France, Germany, Switzerland, and India. The central location of South Africa and other countries indicate that they are frequently collaborating with authors from surrounding countries. Looking at the thickness of the connecting links between countries, it is clear there is a high level of scholarship collaboration taking place between South African and American authors. This is not surprising due to the significant levels of investment by USAID, Pepfar and other governmental and philanthropic funding of research and development to combat the workforce challenges orientated toward addressing the then millennium development goals.

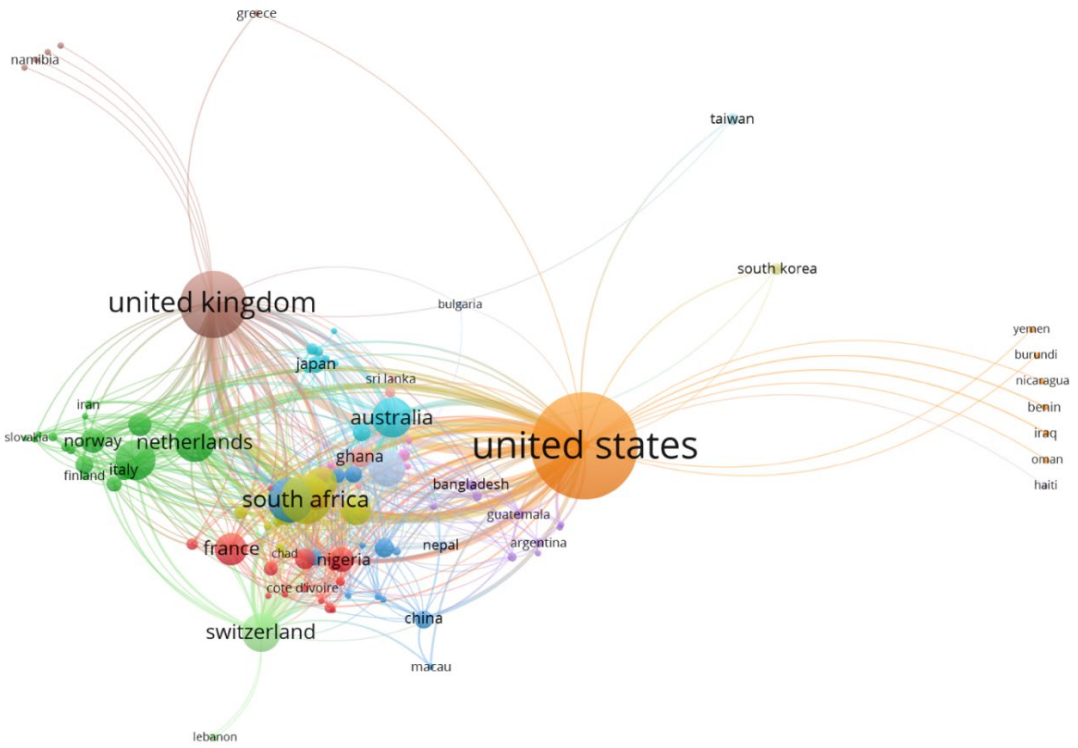

Figure 3: Co-authorship Network Connections by Country

Figure 4 visualizes the relationship between key words used by authors to describe their work. The network of terms consists of 11 clusters. Brief titles and short synopses are provided in Table 1.

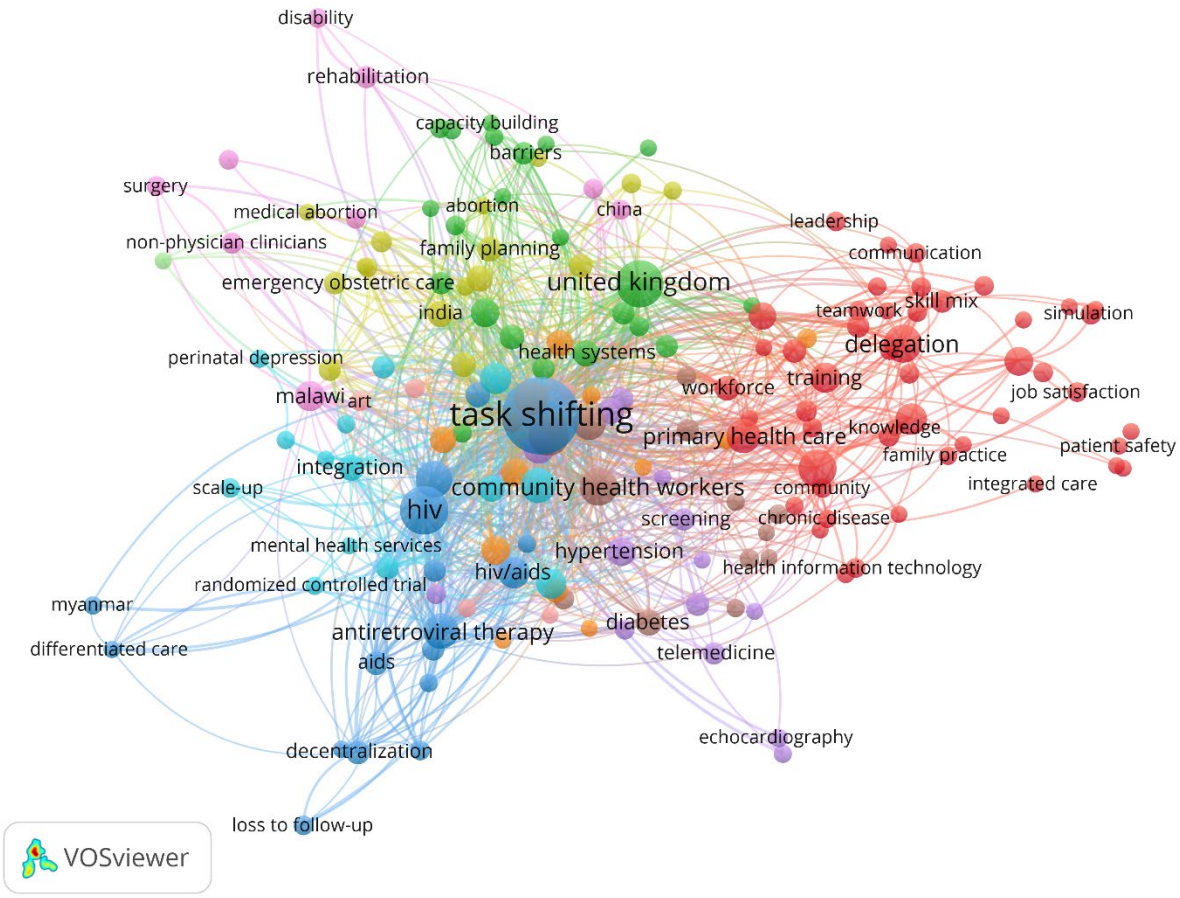

Figure 4: Co-occurrence Analysis of Author Key Words

Cluster & Number of Key Words	Brief Title	Brief Synopsis
One (49)	Workload Redistribution	This cluster contains a set of terms that relate to the ability of health care workers/clinicians to assess or evaluate patients to deliver and document services in an optimum manner.
Two (22)	Child and Adolescent Health Services Redesign	This cluster contains terms that relate to health services redesign for children and adolescents, including prevention and public health-based approaches.
Three (17)	HIV/AIDS Treatment	This cluster contains terms that relate to treatment for HIV and AIDS. It focuses on factors such as services, access, adherence, and follow-up.
Four (16)	Reproductive Health Care	This cluster includes terms that relate to reproductive health care and caregivers, including obstetrics care, family planning, and midwives.
Five (14)	Non-Communicable Disease and Telehealth	This cluster includes terms that relate to chronic health conditions – such as diabetes and high blood pressure – along with their treatment. Components include screening and the use of mobile/telehealth and prevention.
Six (14)	Mental Health	This cluster contains terms that relate to mental health and treatment, including depression, mental health services, and treatment gaps.
Seven (14)	Health Workforce in Africa	This cluster includes terms that focus on human resources for health care in Africa. Components include primary care, access task-sharing, and scope of practice.
Eight (13)	Community and Primary Care of Diabetes	This cluster contains a set of terms that relate to community health care, community and lay health workers, and associated resources. It focuses on health care delivery, promotion, and primary care of diabetes.
Nine (9)	Non-physician Interventions and Surgery	This cluster focuses on non-physician medical, surgical, and rehabilitative care in low- and middle-income countries.
Ten (6)	Universal Health Coverage (UHC)	This cluster focuses on the dimensions associated with the pursuit and attainment of UHC using anti-retroviral therapy as the exemplar.
Eleven (1)	Regulation	A single-term cluster that demonstrates the significance and relatedness of regulatory changes needed to address task shifting.

Table 1: Clusters Identified by Co-occurrence Analysis of Key Words

From inspection of the tiles and associated synopses in Table 1 it is observed that there is a mixture of populations/groups both disease and condition oriented, and various human resources for health and care intervention reform clusters, underpinned by regulatory changes and the pursuit of universal health coverage. The issue of the use of technology and streamlining of interventions noted in the review of paper titles and abstracts during data cleaning, although not dominant, does manifest itself in the general theme of workload redistribution. The isolation of regulation as a single item is both welcome and problematic. The fact that regulation is being addressed is welcome and important however this is being done in isolation from the other themes. Accordingly, there is an opportunity for regulatory scholars to work more collaboratively with peers who are addressing more clinical aspects of task-shifting scholarship.

DISCUSSION

In considering these results it is important to place any discussion within the context of current workforce shortages and future demographic shifts. The report of the High-Level Commission on Health Employment and Economic Growth identified that there is a projected global shortage of 18 million health workers (WHO, 2016a). Unlike many of the previous reports such as the World Health Report (2006) the current work has relevance and requires action by all countries alike. While the high-level commission report did acknowledge the magnitude of issues would be relative to health needs and population demographics, the issue of the longer-term impact on the potential support ratio (PSR) was not extensively explored. According to Chamie (2015), many countries are facing a scenario of fewer people of working age with increasing numbers of retired elderly. In 1950 there were 12 individuals of working age for every retiree (PSR of 12:1), in 2015 the PSR reduced to 8:1 and by 2050 it is projected to fall to 4:1. This shift, along with

societal changes such as multiple-partner and nuclear families, is resulting in a reduction of cross-generational support where multiple generations no longer live in the same household or even in the same city, country, or continent. Consequently, countries such as Scotland are recognizing the need to undertake integrated health and social care workforce planning (NHS Scotland, Scottish Government, and Convention of Scottish Local Authorities (2019). These plans look at how the health and social care needs of individuals and communities can be met with fewer familial supports and less workers available to meet the needs of a graying society. These changes will have significant impact on how different levels of worker are regulated, educated, and held to account.

Furthermore, it is important to note that nursing and health care education do not exist in isolation and hence any solution needs to be viewed from a wider educational policy-impact lens. To bring about the quantum changes needed to transcend the different educational levels necessary to deal with the challenges facing the health and social care sector, a wider dialogue that is congruent with the future of education as much as the future of health and social care delivery is required.

An Increased Interest in Task Shifting

As can be seen from Figure 1, there has been an increase in interest in the use of task shifting, sharing, and delegation over several decades. Research on the topic has resulted in a well-connected set of collaborative researchers who are looking at the application of the techniques to a diverse range of client groups across a wide geography. Challenges in providing access to health care in low- and middle-income countries and in particular relating to health problems featured in the millennium development goals (HIV/AIDSs, tuberculosis, mental health, and

maternal child health) have provided a focus for much of this works as seen from the dominance of literature originating from Africa. This work has often been supported by partner government aid or philanthropic funding. As a result, scholarship has involved a wide range of authors from multiple countries as demonstrated by Figure 3. While regulation has featured as a topic of scholarship more integrated research is needed to look at how lessons from one continent might be applied in other parts of the world.

The Application of Task Shifting

Figure 4 and Table 3 highlight the broad domains where task shifting has been studied. Many of these domains have a wealth of well-designed individual studies and, as a result, data synthesis in the form of systematic and meta-analytical reviews are available. These studies often focus on the clinical effectiveness of using different levels of practitioner to assess and deliver needed services, the cost implications, and the capability of the solution to increase access while maintaining service quality (Ford et al. 2012; Joshi et al. 2014; Hewko et al. 2015). In some cases, wider dimensions have been considered such as the role of different provider groups when considering a comprehensive human resource for health solution including the need for significantly reformed regulatory frameworks (WHO 2008). With increased interest, from around the world, in the concept of right touch regulation using the minimum measure of control to achieve public protection, further research is needed linking regulatory approaches to the quantum of risk that different levels of provider represent (Professional Standards Authority, 2018).

An additional area that has not been adequately addressed by many of the synthesis documents is the role of technology in the delivery of services. Normally, the focus of the analysis is the transfer of a task from one level of practitioner to another or even to lay providers. While technology does feature briefly in some of the clusters, there is no explicit or comprehensive exploration of this approach to increasing capacity. This we consider a weakness. Technology can be used to reduce administrative burdens freeing time for practitioners to undertake those roles that technology is unable, at least at this time, to replace (Benton et al. 2020). Furthermore, it has been noted with the increased use of wearable technology that feedback from these systems may also be used to help prioritize and direct the efforts of clinicians toward those in greatest need of expert intervention (Benton 2014). Such information may also provide a useful means of assessing compliance with clinical or even conduct standards thereby providing regulators with a new means of assessing continuing competence.

A Cautionary Word

Afolabi et al. (2019) noted that the way researchers define roles engaged in task shifting can lead to confusion particularly when seeking to synthesize findings. Accordingly, Afolabi et al. (2019) recommended that greater precision is required by researchers when looking at the issue of task shifting. The WHO, in collaboration with other inter-governmental agencies, does use a standard international classification of occupations (International Labour Organization [ILO], 2008). However, these are not always consistently applied and, as they focus on the delivery of tasks, they are out of step with a competence-based model of service delivery (WHO, 2016b). As a result, the WHO (2016b) recommended that there was a need to revise the ILO (2008) standards to rationalize and streamline the categorizations to better identify families of occupations that

would facilitate progression and reduce redundancy in education. This would result in a more transparent and progressive approach to defining how different providers can safely deliver needed services based on competence. This would further result in a system akin to that used in the knowledge and skills framework in the United Kingdom, where all roles contributing to the delivery of health services can be defined using competencies consisting of a core set augmented by job-specific abilities (Benton, 2003; Department of Health 2004). Another example is the work of the International Council of Nurses [ICN] (2008) that defined a continuum of nursing practice that ranges from those nursing activities that could be delivered by support workers to those needing advanced practice nurse competencies. Although the work by the ICN (2008) is a good starting point in clearly articulating the progressive complexities of competence that each of the five levels (support worker, enrolled nurse(licensed practical nurse), registered nurse, specialist nurse, and advanced practice nurse) can deliver, no mapping to academic-level frameworks has been produced. Such a mapping would help facilitate a more seamless progress and consistent recognition of prior learning. In the coming era of reduced PSR, we believe that such streamlining of education will help facilitate career progression, reduce time and costs associated with competence attainment, optimize regulatory control based on the quantum of risk and help optimize delivery of team-based care.

LIMITATIONS

Using a single bibliometric database, even though it does contain the greatest number of relevant publications, means that some studies have been omitted from the analysis. However, we do not believe that this omission has significantly detracted from the general findings of this study.

CONCLUSIONS

This bibliometric analysis of the indexed literature on task shifting, sharing, and delegation has identified several key areas of strength in the current scholarship literature. It has also identified the centrality of regulation to the delivery and redistribution of responsibilities both within families of practice such as nursing, and across disciplines. Furthermore, it has identified that up until this point the work on task shifting has given only limited consideration to the use of technology as a means of generating more comprehensive solution sets. The need to include technology solutions as part and parcel of future research studies should be pursued alongside how such technology may offer valuable regulatory data in assessing continuing competence.

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